Title: Do microglia play an active role in developmental neuronal cell death?
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Introduction: During brain development approximately 50% of all neurons initially produced are eliminated by cell death. Recent evidence points to microglia having an active role in cell death in neuronal culture which suggests that this effect may also be occurring *in vivo*. Our experiment seeks to test this hypothesis by eliminating microglia in the developing mouse brain and examining effects on cell death.

Methods: We selectively eliminated microglia in mice (C57BL/6 strain) via intracerebroventricular injections of clodronate liposomes (or vehicle liposomes in control mice) on postnatal day (P) 0 and P1, and collected the brains on P2. To test the effectiveness of the clodronate liposomes on eliminating microglia, we sectioned the brains and processed the sections for immunohistochemical detection of microglia using ionized calcium-binding adapter molecule 1(Iba1) as a marker. We are currently quantifying the amount of microglia eliminated with the treatment across several brain regions by using pixel thresholding. We will also process alternative brain sections for immunohistochemical detection of activated caspase-3 (AC3), a marker of cell death, and we will quantify neurons expressing AC3 across multiple brain regions in vehicle and clodronate liposome injected animals.

Results: Tissue has been collected and is currently being processed and analyzed for Iba1 and AC3 labeling. Visual inspection suggests a roughly 50% reduction of microglia in pups injected with clodronate liposomes.

Conclusion: We predict that clodronate liposomes will significantly reduce the number of microglia in the brain. We also predict that elimination of microglia will reduce AC3 labeling, which would suggest that microglia have an active role in developmental cell death.

Keywords: Microglia, development, cell death, apoptosis, Iba1, activated caspase-3, clodronate liposome, mice